BALLISTIC *MISSILE* *DEFENSE* ORGANIZATION

Implementation Guidelines
for BMDO
Open Systems Approach

BMDO Directive No. 5030
January 1998

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SUBJECT: Open Systems Acquisition of Weapons Systems

References: (a) USD (A&T), Acquisition of Weapons Systems
                 Electronics Using Open Systems Specifications
                 and Standards Memorandum, 29 November 1994
                 (http://www.acq.osd.mil/osjtf/policy.html)
             (b) USD (A&T), Open Systems Acquisition of Weapons
                 Systems Memorandum, 10 July 1996
                 (http://www.acq.osd.mil/osjtf/kamin.html)
             (c) BMDO Open Systems Deployment Plan,
                 30 August 1996
             (d) Open Systems Joint Task Force (OS-JTF), The Open
                 Systems Guide, Acquiring Affordable Weapons
                 Systems Electronics, 8 November 1995
                 (http://www.acq.osd.mil/osjtf/osgid.html)
             (e) Open Systems Joint Task Force (OS-JTF), The
                 "Open System Approach" To Weapons Systems
                 Design, 13 June 1996
                 (http://www.acq.osd.mil/osjtf/opensysb.htm)
             (f) DepSecDef, Ballistic Missile Defense Program
                 Management Memorandum, 12 February 1997
             (g) DoDD 5134.9 Ballistic Missile Defense
                 Organization (BMDO), 14 June 1994

A. <u>PURPOSE</u>

    This Directive:

    1. Implements the policy set forth in references (a), (b)
and (c).

    2. Assigns responsibilities and prescribes mandatory
procedures to open systems implementation with BMDO and Service
Ballistic Missile Defense (BMD) Programs.

    3. Establishes management structure and policy enforcement
for implementing the open system approach set forth in
reference (c).

B. APPLICABILITY AND SCOPE

This Directive applies in its entirety to BMD programs as set forth in DoD Directive 5134.9, June 14, 1994 reference (g)and as further emphasized in reference (f). Reference (f) assigns responsibility to the Director, BMDO, for "establishing and maintaining joint system engineering processes necessary to achieve needed performance, developing and maintaining all missile defense architectures, establishing commonality and interoperability standards, and ensuring interoperability across BMD assets and within the overall Air and Missile Defense program over the life of each missile defense system". These objectives shall be accomplished by using an open systems approach in the acquisition of BMD weapons systems. Therefore, BMDO will represent BMD interests in the area of open systems activities, develop and maintain the BMDO Open Systems Acquisition and Supportability Guide, BMDO Open Systems Training Program and the BMDO Open Systems Assessment Program, and oversee the implementation and assessment of an open systems approach throughout all BMD programs.

Where appropriate, BMDO will work with the Services to ensure an open systems approach is followed by the Service acquisition organizations.

C. DEFINITIONS

1. Legacy System: A system that has entered into the Engineering and Manufacturing Development (EMD) phase of acquisition (beyond Milestone II) prior to 15 October 1996.

2. Ballistic Missile Defense Program: A research, development, or acquisition program for weapons systems or weapons system capabilities that provide, support, or interface to missile defense planning and operations.

3. Open Specification: Public specifications that are maintained by an open public consensus process to accommodate new technologies over time and that are consistent with international standards. (IEEE P1003.0/D15)

4. Open System: A system that implements sufficient open specifications for interfaces, services, and supporting formats to enable properly engineered components to be utilized across a wide range of systems with minimal changes, to interoperate with other components on local and remote systems, and to interact with users in a style that facilitates portability. An open system is characterized by the following:

a. Well defined, widely used, preferably non-proprietary interfaces/protocols.

b. Use of standards that are developed/adopted by recognized industry standards bodies or the commercial marketplace.

c. Definition of all aspects of system interfaces to facilitate new or additional systems capabilities for wide range of applications.

d. Explicit provision for expansion or upgrading through the incorporation of additional or higher performance elements with minimal impact on the system. (IEEE POSIX 1003.0/D15 as modified by the Tri-Service Open Systems Architecture Working Group)

5. Open Systems Approach: This approach is a business and engineering strategy to choose specifications and standards adopted by industry standards bodies or de facto standards (set by the market place) for selected system interfaces (functional and physical), products, practices and tools. Selected specifications shall be based on performance, cost, industry acceptance, long term availability and supportability, and upgrade potential. (DoD 5000.2-R, paragraph 4.3.4)

6. Weapons System: A combination of one or more weapons with all related equipment, materials, services, personnel and means of delivery and deployment (if applicable) required for self sufficiency. (JCS Pub 1-02) For BMD this includes: hardware, software, and firmware for weapons systems; information technology systems for weapons systems; sensor systems; and BMC4I systems.

D. POLICY

1. In accordance with reference (c), the use of open system specifications and standards (electrical, mechanical, thermal, etc.) has been directed in the acquisition of weapon systems to the greatest extent practical. An open systems approach has been extended to all major new weapon systems programs and all programs not having passed Milestone II by 15 October 1996, as defined in reference (b). Additionally, all other BMD programs will migrate towards an open systems implementation after consideration of cost, schedule, and performance impact on mission capabilities and interoperability.

2. BMDO will assess open systems approaches used in BMD Programs. BMDO will monitor open system assessments performed by the Service acquisition organization.

3. In order to maximize the benefit of an open systems approach, the BMDO shall coordinate open systems efforts among all BMD programs.

4. Program Managers of legacy weapons systems (as defined in Section C) shall perform an analysis of the applicability of migrating their systems toward an open system. The analysis shall weigh the near-term cost of migration against potential performance benefits and life cycle cost savings.

E. MANAGEMENT STRUCTURE AND RESPONSIBILITIES

1. The Director, BMDO shall:

a. Serve as oversight authority for the implementation of open systems in BMD programs.

b. Enforce BMDO policy regarding open systems implementation and its practicality to BMD programs.

c. Issue appropriate guidance regarding BMD open systems implementation to the Services and other DoD component organizations.

d. Approve/disapprove the Open Systems Implementation Plans.

e. Approve/disapprove the Open Systems Migration Plans.

2. The Chief Architect/Engineer, BMDO/DE, shall:

a. Serve as the single BMDO point of contact on all matters concerning the open systems approach for BMD programs.

b. Establish and enforce BMDO policy regarding open system implementation and its practicality to BMD programs.

c. Review Open Systems Implementation Plans from JN, AQ, and TO for cost, schedule, and performance and synchronization across the programs.

d. Recommend approval/disapproval of Open Systems Implementation Plans to Director, BMDO.

e. Review Open Systems Migration Plans from BMD Program managers for cost, schedule, performance and synchronization of open systems implementation across the programs.

f. Recommend approval/disapproval of Migration Plans to Director, BMDO.

g.   Coordinate with BMDO Deputates to ensure that an open systems approach is being pursued in all areas of BMDO responsibility and that an open systems approach is coordinated among all programs.

h.   Revise and update this Directive biennial.

i.   Establish and chair an Open Systems Working Group (OSWG) consisting of a representative from the JN, AQ, TO, PO and a representative from each of the BMD programs.

j.   Report findings of the OSWG to the Systems Architecture/Engineering Board (SAEB).

k.   Establish a BMDO Open Systems Assessment Program which is compliant with reference (d). Annually, prepare and distribute a memorandum which outlines the assessment program for the coming year. This memorandum will include as a minimum:

(1)   The background and requirement of Open Systems Assessments.

(2)   The scope of the assessment for that year.

(3)   The dates for the annual and semi-annual assessments.

(4)   The dates when program inputs are due.

l.   Consolidate open systems assessments and prepare a report for the Director, BMDO, to submit to USD(A&T).

m.   Establish a BMDO Open Systems Training Program.

n.   Develop a BMDO Open Systems Acquisition and Supportability Guide. This Guide will provide program managers, their staffs, supporting laboratories, and contractors with a framework of open system acquisition and supportability planning knowledge. The Guide should address issues in moving BMDO weapon systems from proprietary closed architectures to open interface standards based solutions and their respective acquisition and supportability needs.

o.   Identify those positions within BMDO/DE by position number which require open systems training.

p.   Provide open systems assessments to the OSWG for review.

3. <u>The Program Manager for National Missile Defense (NMD),
BMDO/JN, shall:</u>

        a. Report to the Director, BMDO, on all matters
concerning open systems implementation in NMD system.

        b. Administer and implement an open systems approach for
the acquisition of a NMD system.

        c. Provide an Open Systems Implementation Plan to
BMDO/DE for evaluation. The Implementation Plan should provide a
detailed account of the actions which will be instituted to
incorporate an open systems approach in National Ballistic
Missile Defense weapon system acquisition. This plan will be
reviewed and updated annually. Updates will be submitted to
BMDO/DE for review. Progress in implementing the approved Open
Systems Implementation Plans will be part of the annual
assessment program.

        d. Provide an Open Systems Migration Plan to BMDO/DE for
evaluation. The migration plan should be written by the Program
Manager for each legacy weapon system. The Migration Plan should
highlight the timeline for the open systems implementation. This
plan will be reviewed and updated annually. Updates will be
submitted to BMDO/DE for review. Progress in implementing the
approved Open Systems Migration Plans will be part of the annual
assessment program.

        e. Designate an open systems focal point in writing to
DE. This focal point shall be a member of the OSWG.

        f. Conduct an open systems assessment of NMD system IAW
procedures described in references (b) and (d) and paragraph
E.2.k above. Report findings of open systems assessments to
BMDO/DE.

        g. Identify those positions within BMDO/JN by position
number which require open systems training and provide to
BMDO/DE.

        h. Include Open Systems Planning as a specific item for
inclusion in meeting agendas and discussions.

4. <u>The Deputy for Theater Air and Missile Defense (TAMD),
BMDO/AQ, shall:</u>

        a. Report to the Director, BMDO, on all matters
concerning open systems implementation in TAMD systems.

b. Administer and implement an open systems approach for the acquisition of TAMD systems.

c. Provide an Open Systems Implementation Plan to BMDO/DE for evaluation. The Implementation Plan should provide a detailed account of the actions which will be instituted to incorporate an open systems approach in Theater Ballistic Missile Defense weapons systems acquisitions. This plan will be reviewed and updated annually. Updates will be submitted to BMDO/DE for review. Progress in implementing the approved Open Systems Implementation Plans will be part of the annual assessment program.

d. Provide Open Systems Migration Plans to BMDO/DE for evaluation. The migration plan should be written by the Program Manager of each legacy weapon system. The Migration Plan should highlight the timeline for the open systems implementation. This plan will be reviewed and updated annually. Updates will be submitted to BMDO/DE for review. Progress in implementing the approved Open Systems Migration Plans will be part of the annual assessment program.

e. Designate an open systems focal point in writing to DE. This focal point shall be a member of the OSWG. Additionally, AQ will identify a representative from each MDAP system. These representatives will be members of the OSWG.

f. Conduct an open systems assessment of TAMD system IAW procedures described in references (b) and (d) and paragraph E.2.k above. Report findings of open systems assessments to BMDO/DE.

g. Identify those positions within BMDO/AQ by position number which require open systems training and provide to BMDO/DE.

h. Include Open Systems Planning as a specific item for inclusion in meeting agendas and discussions.

5. The Deputy for Technical Operations, BMDO/TO, shall:

a. Report to the Director, BMDO, on all matters concerning open systems implementation in BMDO-sponsored technology developments.

b. Administer and implement an open systems approach for the development of advanced BMD technologies.

c. Provide an Open Systems Implementation Plan to BMDO/DE for evaluation. The Implementation Plan should provide a

detailed account of the actions which will be instituted to
incorporate an open systems approach in the acquisition of
technology to support BMD weapons systems acquisitions. This
plan will be reviewed and updated annually. Updates will be
submitted to BMDO/DE for review. Progress in implementing the
approved Open Systems Implementation Plans will be part of the
annual assessment program.

        d.   Provide Open Systems Migration Plans to BMDO/DE for
evaluation. The Migration Plan should highlight the timeline for
the open systems implementation in BMDO sponsored technology
programs. The migration plan should be written by the Program
Manager for each technology area. This plan will be reviewed and
updated annually. Updates will be submitted to BMDO/DE for
review. Progress in implementing the approved Open Systems
Migration Plans will be part of the annual assessment program.

        e.   Designate an open systems focal point in writing to
DE. This focal point shall be a member of the OSWG.

        f.   Conduct open systems assessments of technology
programs IAW procedures described in references (b) and (d) and
paragraph E.2.k above. Report findings of open systems
assessments to BMDO/DE.

        g.   Identify those positions within BMDO/TO by position
number which require open systems training and provide to
BMDO/DE.

        h.   Include Open Systems Planning as a specific item for
inclusion in meeting agendas and discussions.

   6.   <u>The Deputy for Program Operations, BMDO/PO, shall</u>:

        a.   Designate an open systems focal point in writing to
DE. This focal point shall be a member of the OSWG.

        b.   Provide an Open Systems Implementation Plan to
BMDO/DE for evaluation. The Implementation Plan should provide a
detailed account of the actions which will be instituted to
incorporate an open systems approach in support of BMD weapons
systems acquisitions. This plan will be reviewed and updated
annually. Updates will be submitted to BMDO/DE for review.
Progress in implementing the approved Open Systems Implementation
Plans will be part of the annual assessment program.

        c.   Provide Open Systems Migration Plans to BMDO/DE for
evaluation. The migration plan should be written by the Program
Manager of each legacy weapon system. The Migration Plan should

highlight the timeline for the open systems implementation. This plan will be reviewed and updated annually. Updates will be submitted to BMDO/DE for review. Progress in implementing the approved Open Systems Migration Plans will be part of the annual assessment program.

        d.   Identify those positions within BMDO/PO by position number which require open systems training to BMDO/DE.

        e.   Conduct open systems assessments of technology programs IAW procedures described in references (b) and (d) and paragraph E.2.k above. Report findings of open systems assessments to BMDO/DE.

   7.   The BMDO <u>Open Systems Working Group</u> (OSWG) is chartered as a cooperative effort of the Directorates of BMDO and the Services producing BMD systems under the sponsorship of BMDO. The OSWG shall:

        a.   Coordinate, review, and assess the implementation of open systems processes within and across all BMD programs.

        b.   Recommend changes to the open systems approach within BMDO.

        c.   Conduct or sponsor the annual and semi-annual open systems assessments as required by the USD(A&T), reference (b).

        d.   Review assessments for consistency and success in achieving the goals set forth in the Implementation and Migration Plans. Where inconsistencies are identified, coordinate with the Chief Architect/Engineer and forward open systems technology issues to the SAEB for resolution.

        e.   Identify like items within programs which can be used within multiple programs.

        f. Validate the BMDO positions which require open systems training.

        g. Develop an OSWG Charter.

F.   <u>POLICY ENFORCEMENT</u>

   1.   Compliance with this Directive is mandatory for all BMD programs. The Director, BMDO, shall enforce the open systems acquisition policy for these programs.

   2.   The OSWG shall review open systems assessments and present results and issues to SAEB.

3. The SAEB shall review issues and reports presented by the OSWG and make recommendations on issue resolution to the Director, BMDO.

4. Legacy systems (as defined by Section C) shall be reviewed on a case-by-case basis to determine compliance requirements.

5. The Director, BMDO, may withhold system/program funding until a credible approach to achieving compliance with this directive is produced.

G. REVIEW AND MODIFICATION PROCESS

This Directive shall be reviewed biennially from the date signed for continued applicability and scope. Modifications to this Directive shall be accomplished during the biennial review process.

H. SECURITY

All information and reporting documents resulting from this Directive will be governed by, and handled in accordance with, the Security Classification Guide of the originating organization.

I. REPORTING REQUIREMENTS

1. JN, AQ, TO, and PO are required to designate open systems focal points in writing to DE.

2. JN, AQ, TO and PO are required to provide a copy of their Open Systems Implementation Plan to DE.

3. JN, AQ, TO and PO are required to submit an open systems report assessing the status of deployment of the open systems approach in their programs in accordance with reference (b).

4. The Chief Architect/Engineer shall consolidate open systems assessment reports from the Deputates (JN, AQ, TO and PO) and prepare a consolidated report for the Director, BMDO, to submit to USD(A&T).

5. JN, AQ, TO and PO are required to submit a copy of their Open Systems Migration Plan to DE.

6. JN, AQ, TO, DE and PO are required to identify those positions within their respective organizations which require open systems training.

J.   INTERNAL MANAGEMENT CONTROL

    Internal management controls (IMCs) in accordance with reference (c) are described in Sections E. and F. of this Directive.

K.   EFFECTIVE DATES

    This Directive is effective immediately.

/original signed/

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Director